# COMPUTER ENGINEERING

## B.S. Degree

The mission of the Electrical and Computer Engineering Department is to offer the highest quality, contemporary education in electrical and computer engineering at the undergraduate and graduate levels and to perform research appropriate to the technical needs of Alaska, the nation and the world. The curriculum is designed to ensure that fundamentals and specialized skills are acquired by the student. The program prepares engineering graduates to enter practice and provides the theoretical background for students entering graduate studies.

Computer engineering is a discipline that includes hardware and software design and provides a deep understanding of their interrelationship. It combines electrical engineering fundamentals, like microelectronics, electrical circuits and devices, digital signal processing, network design, communications systems, computer architecture, hardware design and systems analysis, with computer science concepts, including algorithms, software, graphics and artificial intelligence. Computer engineers design, analyze, produce, operate, program and maintain computer and digital systems. They apply theories and principles of science and mathematics to the design of hardware, software, networks and processes to solve technical problems. Most importantly, they understand how the hardware affects the software and vice versa.

Over the past decades, computers have evolved into complex systems that may consist of single machines or many interconnected computers linked by a data network. In one form or another, computers now control telephone and communications systems, process control and manufacturing automation systems, financial technology systems, management information systems, augmented reality systems, and biomedical devices. They are in household appliances, automobiles, transportation systems and our pockets, and they're on our wrists. To work in the constantly evolving discipline of computer systems engineering, the computer engineer must acquire competence in both digital computer hardware and the fundamentals of software engineering.

Careers in computer engineering are as wide and varied as computer systems themselves. Systems range from embedded computer systems found in consumer products or medical devices to control systems for automobiles, aircraft and trains, and to more wide-ranging applications in telecommunications, financial transactions and information systems.

The Electrical and Computer Engineering Department faculty provide a positive learning environment that enables students to pursue their goals in an innovative program that is rigorous and challenging, open and supportive. The BSCpE program at UAF, long accredited by the Engineering Accreditation Commission of ABET, develops practical skills by emphasizing hands-on experience in the design, implementation and validation of electrical systems in an environment that fosters and encourages innovation and creativity. This approach builds the foundation for the program's educational objectives:

1. Breadth: Graduates will use their broad education emphasizing computer engineering as the foundation for productive careers in the public or private sectors, graduate education, lifelong learning and engineering in extreme environments.
2. Depth: Graduates will apply their understanding of the fundamental knowledge prerequisite for the practice of and/or advanced study in computer engineering, including its scientific principles, rigorous analysis and creative design.
3. Professional skills: Graduates will apply skills in clear communication, responsible teamwork, professional attitudes and ethics needed to succeed in the complex modern work environment.

These objectives serve the department, college and university missions by ensuring that all graduates of the program have received a high quality, contemporary education that prepares them for a rewarding career in computer engineering.

Candidates for the B.S. degree are required to take the state of Alaska Fundamentals of Engineering Examination in their general field.

For more information about the computer engineering program's mission, goals and educational objectives, visit the College of Engineering and Mines  (https://www.uaf.edu/cem/about/accreditation.php)accreditation website.

Minimum Requirements for Computer Engineering B.S. Degree: 127 credits

Learn more about the bachelor's degree in computer engineering, including an overview of the program, career opportunities and more.

College of Engineering and Mines
Department of Electrical and Computer Engineering (http://cem.uaf.edu/ece/)
907-474-7137

## Programs
## Degree

- B.S., Computer Engineering (http://catalog.uaf.edu/bachelors/bachelors-degree-programs/computer-engineering/bs/)